

Replacement Sheet

Gene III leader sequence in KO7 helper phage

| SEQ ID NO. 1 | GTG AAA TAA TTA TTC GCA ATT CCT TTA GTT CCT TTC TAT TCT CAC TCC GCT |
|--------------|---|
| SEQ ID NO. 2 | V K K L L F A I P L V V P F Y S H S A |

Gene III leader sequence in KO7kpn helper phage

| SEQ ID NO. 3 | GTG AAA AAA TTA TTA TTC GCA ATT CCT TTA <u>GTA</u> CCT TTC TAT TCT CAC TCC GCT |
|--------------|--|
| SEQ ID NO. 2 | V K K L L F A I P L V V P F Y S H S A |



Fig. 3B

Replacement Sheet



GR2-Myc domain coding sequence in GM-UltraHelper phage genome

| SEQ ID. NO. | 4 | KpnI | Gene III leader | GR2 | |
|---|---|---|-----------------------------------|---|------|
| | | | -----TTAGTGGTACCTCTATTCTCACTCCGCT | ACATCCCGCCTGGAGGGCTACAGTCAGAAACCATCGCCTGC | GCA |
| SEQ ID. NO. | 5 | | | | NoII |
| M K I T E L D K D L E E V T M Q L Q D V G G C A A A | - L V V P F Y S H S A T S R L E G L Q S E N H R L R | ATGAAAGATCACAGAGCTGGATAAAGACTTGGAAAGAGGTACCCATGGCAGGACGTGGAGGTGTC | GGGGCGCGCA | | |
| SEQ ID. NO. | 6 | | | | |
| F O K I T S E D T R S G G T V E S C L A K - | Myc-tag | BglII | Gene III | | |
| | GAAACAAAAACTCATCTCAAGAGGGATCTG | AGATCTCGAGGGGGT | ACTGTGTAAAGTTGTTAGCAAAA--- | | |

Fig. 5B

Replacement Sheet



Trypsin cleavage sites at GR2-Myc domain on GM-UltraHelper phage

SEQ ID NO. 6

GR2 domain

T S R **L** E G L Q S E N H R **L** R **M** K **I** T E L D K **D** L E E V

Myc-tag

T M Q L Q D V G G C A A A E Q K **L** I S E E D L R **S** G G G

Fig. 5C

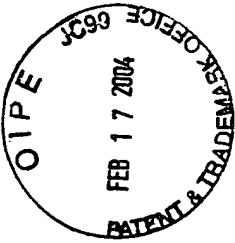
Replacement Sheet

Complete vector sequence of pABMX14

CASE NO. 7

Fig. 9B

Replacement Sheet



Engineered gene III sequence in CM phage - Nucleotide Sequence: SEQ ID. NO. 8;
Amino Acid Sequence: SEQ ID. NOS. 9 and 25

SEQ ID. NO. 8

KpnI Gene III leader Amber stop NotI
---TTAGTGGTACCTTCTATTCTCACTCCGCT TAGGCTTGGGTGGTGGCCGGCAGAACAAAAACTCATCTCAGAAAGAGGATCTGAGATCT AGATCTGGGA

SEQ ID. NO. 9

- L V V P F Y S H S A * A C G A A E Q K L I S E E D E D L R S R S G

Gene III

GGGGT ACTGTTGAAAGTTGTTAGCAAAACCTCATACAGAAAATTCACTAACGTTAGATCGTTACGCT-----
G G T V E S C L A K P H T E N S F T N V W K D D K T L D R Y A - -

Fig. 13B

Replacement Sheet



Complete vector sequence of pABMX15

SEQ ID NO. 10

Fig. 15B



Replacement Sheet

Engineered gene III Sequence in GMCT phage genome

| | | | |
|---|--|-----------------|------------|
| SEQ ID. NO. 11 | KpnI | Gene III Leader | GR2 domain |
| -TTAGTGGTACCTTTCTATTCTCACTCCGCT ACATCCGCCTGGAGGGCTACAGTCAGAAAACCATCGCCTGGAAATGAGATCACAGAGCTGGATAAA | | | |
| SEQ ID. NO. 12 | | | |
| - L V V P F Y S H S A T S R L E G L Q S E N H R L R M K I T E L D K | Not I Myc-tag | | |
| GACTTGGAAAGAGGTCAACCATGCGAGCTGCAGGACGTCGGAGGTGTC GGCGCC <u>GGCGAGAACAAAAACTGATCTCAGAAAGGGATCTGACGGTGCT</u> GGCGGC | | | |
| D L E E V T M Q L Q D V G G C A A A E Q K L I S E E D L T R A G G | CT domain of Gene III | | |
| G S G G S G G G S E G G G S E G . G G S E G G S E G G S E G G S | GGCTCTGGTGGTTCTGGTGGGGCTCTGAGGGTGGGGCTCTGAGGGTGGGGCTCTGAGGGTGGGGCTCTGAGGGTGGGGCTCTGAGGGTGGGGCTCC | | |
| G S G D F D Y E K M A N A N K G A M T E N A D E N A L Q S D A K G | GGTTCCGGTGA <u>TTTGATATGAAAAATGGCAAACGCTAATAAGGGGCTATGACCGAAAAATGCCGATGAAAAACGGGCTACAGTCTGACGCTAAAGGCCAA</u> | | |
| L D S V A T D Y G A A I D G F I G D V S G L A N G N G A T G D F A G | G S CTTGATTCTGTGCTACTGATTACGGTGTGCTATCGATGGTTTCATGGTGACGTTCCGGCCCTGGTAATGGTAATGGTGTACTGGTGA <u>TTGGCTCC</u> | | |
| S N S Q M A Q V G D G D N S P L M N N F R Q Y L P S L P Q S V E C R | L D S V A T D Y G A A I D G F I G D V S G L A N G N G A T G D F A G TCTAATTCCCAATGGCTCAAGTGGTGA <u>CCGGTAAATTACCTTAATGAATAATTTCACCTTAATGAAATTTACCTCCCTCAATCGGTTGAATGTCGC</u> | | |
| P F V F G A G K P Y E F S I D C D K I N L F R G V F A F L L Y V A T | S/N S Q M A Q V G D G D N S P L M N N F R Q Y L P S L P Q S V E C R | | |
| CCTTTGGTCTTGGGGTGGTAAACCATATGAATTTCATTGATTGATTGATTAACCTTATTGCTTAATGGTGA <u>AAATAACCTTATTCCGGTGTCTTGC</u> ACC | | | |
| TTTATGTA <u>TGTTCTACGTTGGCTAACATACTGCGTAATAAGGAGTCTTAATAA</u> GGGGCC <u>CACAATTCACAGTAAGGAGGTTAATAA</u> ATGAAA | | | |
| F M Y V F S T F A N I L R N K E S * * | F M Y V F S T F A N I L R N K E S * * | | |
| OmpA leader | M K | | |
| AAGACAGCTATGCGATTGCAGTGGCACTGGCTGGTTGGCTACCGTAGGGCT | BglII Gene III | | |
| K T A I A V A L A G F A T V A Q A R S G G T V E S C L A K - | AGATCTGGAGGGGGT ACTGTTGAAAGTTGGTTAGCCAAA--- | | |

Fig. 19B

Replacement Sheet



PABMD1 vector: sequence from AgeI to Sall – Nucleotide Sequence: SEQ ID. NO. 13

Amino Acid Sequence: SEQ ID. NOS. 14 and 26

| SEQ ID. NO. | 13 | AgeI | EP | S/D | SEQ ID. NO. 26 |
|--|------|--|---------------------------------------|---|------------------|
| lac promoter/lac O1 | | | | | |
| AATTGTGAGCGATAACAAATT ACCGGT | TCTT | TTAACCTTAG | TAAGGAGG | AATTAAGAAA | |
| P8 Leader | | | | | |
| ATGAAAAAGTCTTAGTCTCAAAGCCTCCGTAGCCGGTACCCCTCGTTCGGATGCTAAGCTTCGCT TCTAGA | | | | | |
| SEQ ID. NO. | 14 | NotI | HA-tag | His-tag | Amber stop BglII |
| M K S L V L K A S V A V A T L V P M L S F A S R | | GCGGCCGCT TATCCATACGACGTACCAGACTACCCA GGAGGT | CATCACCATCACCAT | TAG | AGATCT |
| | | A A Y P Y D V P D Y A G G | H H H H H H * | R S | |
| | | Gene 3 | Sall | | |
| | | GGAGGGGT ACTGTTGAAAGTTAGCAAA ----- | GCTAACATACTGCGTAATAAGGAGTCTTAA GTCGAC | | |
| | | G G T V E S C L A K ----- | A N I L R N K E S * | | |
| PABMD2 vector: sequence from <u>AgeI</u> to <u>Sall</u> | | | | | |
| lac promoter/lac O1 | AgeI | EP | S/D | | |
| AATTGTGAGCGATAACAAATT ACCGGT | TCTT | TTAACCTTAG | TAAGGAGG | AATTAAGAAA | |
| pelB Leader | | | | Nco I | PstI |
| | | | | ATGAAATACCTATTGCCTACGGCAGCCGGCTGGATTACTCGGGCCAGCCAGCCATGGGGCCCTGCAGGCCCTCTAGA | XbaI |
| | | | | M K Y L L P T A A A G L L L A Q P A M A A L Q A S R | |
| SEQ ID. NO. | 26 | NotI | HA-tag | His-tag | Amber stop BglII |
| | | GCGGCCGCT TATCCATACGACGTACCAGACTACCCA GGAGGT | CATCACCATCACCAT | TAG | AGATCT |
| | | A A Y P Y D V P D Y A G G | H H H H H H * | R S | |
| | | Gene 3 | Sall | | |
| | | GGAGGGGT ACTGTTGAAAGTTAGCAAA ----- | GCTAACATACTGCGTAATAAGGAGTCTTAA GTCGAC | | |
| | | G G T V E S C L A K ----- | A N I L R N K E S * | | |

Fig. 22B

Replacement Sheet



GR1 Sequence Range: 1 to 146

| | | | | | | | | | | | | | | | | | |
|-----------------------|---|----|-----|----|-----|---|-----|---|---|---|---|---|---|-----|---|---|---|
| XbaI | 10 | 20 | 30 | 40 | 50 | | | | | | | | | | | | |
| SEQ ID. NO. 15 | <u>TCTAGAGGTGGAGGAGGTGAGGAGAAAGTCCCGGCTGGAGAAGGAGAA</u> | | | | | | | | | | | | | | | | |
| SEQ ID. NO. 16 | S | R | G | G | E | K | S | R | L | L | E | K | E | N | | | |
| | 60 | | 70 | | 80 | | 90 | | | | | | | 100 | | | |
| | C | C | G | A | A | G | A | A | G | G | G | T | G | T | G | A | A |
| | R | E | L | E | K | I | I | A | E | K | E | E | R | V | S | E | |
| | 110 | | 120 | | 130 | | 140 | | | | | | | | | | |
| | T | G | G | C | A | T | C | A | T | C | T | G | T | T | G | A | G |
| | L | R | H | Q | L | Q | S | V | G | G | C | * | * | * | | | |

GR2 Sequence Range: 1 to 140

| | | | | | | | | | | | | | | | | |
|-----------------------|--|----|-----|----|-----|---|----|---|---|---|---|---|---|---|---|-----|
| XhoI | 10 | 20 | 30 | 40 | 50 | | | | | | | | | | | |
| SEQ ID. NO. 17 | <u>TCTCGAGGAGGTGGAAACATCCCGCCTGGAGGGCTACAGTCAGAAAA</u> | | | | | | | | | | | | | | | |
| SEQ ID. NO. 18 | S | R | G | G | G | T | S | R | L | E | G | L | Q | S | E | N |
| | 60 | | 70 | | 80 | | 90 | | | | | | | | | 100 |
| | C | C | A | T | G | C | A | A | G | A | G | T | G | A | A | G |
| | H | R | L | R | M | K | I | T | E | L | D | K | D | L | E | E |
| | 110 | | 120 | | 130 | | | | | | | | | | | |
| | T | C | A | C | T | G | A | G | T | C | G | G | T | G | G | G |
| | V | T | M | Q | L | Q | D | V | G | G | C | A | A | A | | |

Fig. 23

Replacement Sheet

Complete vector sequence of pABMX22

Fig. 25B

Replacement Sheet

Complete vector sequence of pABMXbd-1

SEQ ID NO: 24

Fig. 26B